



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, ILLINOIS 60532-4352

April 20, 2021

Mr. David Rhoades  
Senior VP, Exelon Generation Company, LLC  
President and CNO, Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: BYRON STATION – INTEGRATED INSPECTION REPORT 05000454/2021001  
AND 05000455/2021001

Dear Mr. Rhoades:

On March 31, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Byron Station. On April 7, 2021, the NRC inspectors discussed the results of this inspection with Mr. H. Welt, Acting Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

No findings or violations of more than minor significance were identified during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

**/RA/**

Hironori Peterson, Chief  
Branch 3  
Division of Reactor Projects

Docket Nos. 05000454 and 05000455  
License Nos. NPF-37 and NPF-66

Enclosure:  
As stated

cc w/ encl: Distribution via LISTSERV®

Letter to David Rhoades from Hironori Peterson dated April 20, 2021.

SUBJECT: BYRON STATION – INTEGRATED INSPECTION REPORT 05000454/2021001  
AND 05000455/2021001

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**U.S. NUCLEAR REGULATORY COMMISSION  
Inspection Report**

Docket Numbers: 05000454 and 05000455

License Numbers: NPF-37 and NPF-66

Report Numbers: 05000454/2021001 and 05000455/2021001

Enterprise Identifier: I-2021-001-0017

Licensee: Exelon Generation Company, LLC

Facility: Byron Station

Location: Byron, IL

Inspection Dates: January 01, 2021 to March 31, 2021

Inspectors: D. Betancourt-Roldan, Senior Resident Inspector  
C. Thompson, Illinois Emergency Management Agency  
J. Weigandt, Resident Inspector

Approved By: Hironori Peterson, Chief  
Branch 3  
Division of Reactor Projects

Enclosure

## **SUMMARY**

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Byron Station, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

### **List of Findings and Violations**

No findings or violations of more than minor significance were identified.

### **Additional Tracking Items**

None.

## **PLANT STATUS**

Unit 1 began the inspection period operating at full power. With the exception of minor reductions in power to support scheduled testing activities or small load changes requested by the transmission dispatcher, the unit remained at or near full power for the entire inspection period.

Unit 2 began the inspection period operating at full power. With the exception of minor reductions in power to support scheduled testing activities or small load changes requested by the transmission dispatcher, the unit remained at or near full power for the entire inspection period.

## **INSPECTION SCOPES**

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the Coronavirus Disease 2019 (COVID-19), resident inspectors were directed to begin telework and to remotely access licensee information using available technology. During this time, the resident inspectors performed periodic site visits each week; conducted plant status activities as described in IMC 2515, Appendix D, "Plant Status"; observed risk-significant activities; and completed on-site portions of IPs. In addition, resident and regional baseline inspections were evaluated to determine if all or portions of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on-site. The inspections documented below met the objectives and requirements for completion of the IP.

## **REACTOR SAFETY**

### 71111.01 - Adverse Weather Protection

#### Impending Severe Weather Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the adequacy of the overall preparations to protect risk-significant systems from an impending winter storm on January 25 through January 26, 2021.

#### 71111.04 - Equipment Alignment

##### Partial Walkdown Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) 1A safety injection (SI) prior to B test on February 10, 2021
- (2) 2B emergency diesel generator (EDG) during 2A semi-annual test as set forth in Work Order (WO) 5081391 on March 10, 2021
- (3) 2A EDG prior to 2B EDG work on March 22, 2021

##### Complete Walkdown Sample (IP Section 03.02) (1 Partial)

- (1) (Partial)  
The inspectors evaluated system configurations during a complete walkdown of the Unit 2 auxiliary feedwater (AF) system on February 3 and March 26, 2021.

#### 71111.05 - Fire Protection

##### Fire Area Walkdown and Inspection Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) Unit 1 Division 12 Miscellaneous Electrical Equipment Room (MEER) and Battery Room, Fire Zones (FZs) 5.4-2, 5.5-2, and 5.6-2 on March 10, 2021
- (2) 1B EDG Room, FZ 18.1-1 on March 4, 2021
- (3) Unit 2 Division MEER, FZ 5.4-2 on March 17, 2021

##### Fire Brigade Drill Performance Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the on-site fire brigade training and performance during an unannounced fire drill on January 30, 2021.

#### 71111.07A - Heat Sink Performance

##### Annual Review (IP Section 03.01) (1 Sample)

The inspectors evaluated readiness and performance of:

- (1) Component cooling heat exchanger tube plugging on February 16, 2021

## 71111.11Q - Licensed Operator Regualification Program and Licensed Operator Performance

### Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

- (1) The inspectors observed and evaluated licensed operator performance in the Control Room during implementation of Engineering Change (EC) 632575, Unit 1 "Tref" adjustment on March 3, 2021. The inspectors also observed operator performance in the Control Room during 0BOSR MP-1 max VAR testing under Work Order 5029908 on March 11, 2021.

### Licensed Operator Regualification Training/Examinations (IP Section 03.02) (1 Sample)

- (1) The inspectors observed and evaluated a licensed operator training regualification scenario on February 15, 2021.

## 71111.12 - Maintenance Effectiveness

### Maintenance Effectiveness (IP Section 03.01) (2 Samples)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

- (1) Issues with Unit 2 power oscillations as documented in Action Request (AR) 04396745 on January 25, 2021
- (2) Control Room heating ventilation and air conditioning (VC) system on February 10, 2021

## 71111.13 - Maintenance Risk Assessments and Emergent Work Control

### Risk Assessment and Management Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) 1B residual heat removal (RH) work window on February 10, 2021
- (2) 1A SI work window as set forth in WO 5067292 on March 3, 2021
- (3) Work risk during the week of March 15, 2021
- (4) Work risk during the week of March 29, 2021

## 71111.15 - Operability Determinations and Functionality Assessments

### Operability Determination or Functionality Assessment (IP Section 03.01) (5 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) The 2B diesel generator tripped during start for monthly run as documented in AR 4397062 on January 21, 2021

- (2) VC damper issue as documented in AR 4399739 on January 20, 2021
- (3) 0B essential service water (SX) cooling tower fan oil press alarm as documented in AR 4403121 on February 19, 2021
- (4) Unit 2 Power Distribution Monitoring System/Plant Process Computer problem as documented in AR 4407267 on March 13, 2021
- (5) 1FW009A, Main feedwater isolation valve hydraulic pump cycling as documented in AR 441170 on March 26, 2021

#### 71111.18 - Plant Modifications

##### Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

- (1) 1A EDG JW Clr leak repair clamp as documented in ARs 4393165 and 4389788 on February 3, 2021
- (2) Revise Unit 1 Reactor Coolant System (RCS) Program Reference Temperature from 587.0 deg F to 586.5 deg F in the Ovation™ Digital Control System as documented in WO 5093368 and EC 632575 on March 3, 2021

#### 71111.19 - Post-Maintenance Testing

##### Post-Maintenance Test Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the following post-maintenance test activities to verify system operability and functionality:

- (1) 1A containment spray (CS) post-maintenance test (PMT) following maintenance as set forth in WO 04966365 on February 3, 2021
- (2) 2A CS PMT per 2BOSR 5.5.8.CS.5-1c as set forth in WO 5115336 on February 26, 2021
- (3) 1A SI pump bearing and seal work and test per 1BOSR 5.5.8.SI.5-1a as set forth in WO 5112994 on March 4, 2021
- (4) 0B Fire Pump PMT following maintenance as set forth in WO 5136033 on March 26, 2021

#### 71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

##### Surveillance Tests (other) (IP Section 03.01) (3 Samples)

- (1) 1BOSR 7.5.4-2, 1B AF monthly test as set forth in WO 5118865 on February 19, 2021
- (2) Surveillance Frequency Change, (STI BY-20-004), Revise valve alignment verification from monthly to quarterly on March 3, 2021
- (3) 2BOSR 8.1.2-1, 2A Diesel Generator Test as set forth in WO 5115341, on February 3, 2021



Inservice Testing (IP Section 03.01) (1 Sample)

- (1) Group A inservice test (IST) for 2RH01PB on January 23, 2021

71114.06 - Drill Evaluation

Select Emergency Preparedness Drills and/or Training for Observation (IP Section 03.01) (1 Sample)

- (1) The inspectors observed and evaluated an emergency preparedness (EP) drill on February 9, 2021.

Drill/Training Evolution Observation (IP Section 03.02) (1 Sample)

The inspectors evaluated:

- (1) The inspectors observed and evaluated a DEP scenario on February 19, 2021.

**OTHER ACTIVITIES – BASELINE**

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 03.01) (2 Samples)

- (1) Unit 1 (January 1, 2020 – December 31, 2020)
- (2) Unit 2 (January 1, 2020 – December 31, 2020)

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 03.02) (2 Samples)

- (1) Unit 1 (January 1, 2020 – December 31, 2020)
- (2) Unit 2 (January 1, 2020 – December 31, 2020)

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 03.03) (2 Samples)

- (1) Unit 1 (January 1, 2020 – December 31, 2020)
- (2) Unit 2 (January 1, 2020 – December 31, 2020)

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (IP Section 02.03) (1 Sample)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) Use of plant barrier impairment (PBI) permits during maintenance activities on February 10, 2021

## INSPECTION RESULTS

Observation: Use of Plant Barrier Impairment Permits During Maintenance Activities	71152
<p>On February 10, 2021, during the NRC performed a walkdown of protected equipment associated with a 1B RH cubicle cooler work window (WO 4952630). During this walkdown the NRC noted the Unit 1 containment spray (CS) pump area door, 0DSD245, was wide open and unattended. Upon identification the inspectors notified the shift of the condition. The inspectors proceeded to review the PBI program documents and noted that they only allowed the door to be open 1 inch or less due to ventilation requirements.</p> <p>The inspectors reviewed the Corrective Action Program (CAP) causal evaluation performed by the licensee for the initial as found condition. The evaluation stated that two additional doors (0DSD847, and 0DSD253) had also been blocked open effectively linking the 1A CS room, 1B CS room and 1B RH room. Based on existing and expected pressures, the evaluation concluded that there was reasonable assurance that the auxiliary building ventilation was operable. Additionally, the evaluation on the human performance aspect concluded that the lack of briefing the specific PBI requirements to the assigned individuals prevented the identification and correction of the condition. Based on an inadequate brief or turnover, the responsible individuals did not understand that the door could not be propped full open due to ventilation requirements. The inspector identified that the failure to follow the plant barrier impairment program when blocking open doors 0DSD245, 0DSD847, and 0DSD253 was a performance deficiency, but that it was of minor significance since it did not affect the availability, capability or reliability of safety systems.</p> <p>To further understand if there were general issues with PBIs the inspectors looked in the CAP system and found that over the course of a month, three instances of inadequate use of PBIs were entered in the CAP as listed below:</p> <p>2/2/2021: AR 04399590, New PBI required for 1A CS pump work window</p> <p>2/17/2021: AR 04403035, NRC identified item on PBI</p> <p>3/9/2021: AR 04407661, Incorrect PBI permit generated for 2A RH work window</p> <p>Based on the information above the inspector saw that there was a potential that Byron staff may not be fully aware that there are more PBI requirements than just performing a fire watch. The observation was shared with the site who is addressing this item as part of their planned corrective actions.</p>	

## EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On April 7, 2021, the inspectors presented the integrated inspection results to Mr. H. Welt, Acting Site Vice President, and other members of the licensee staff.

## DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Corrective Action Documents	04393161	Degraded Piping	12/31/2020
	Procedures	OP-AA-108-111-1001	Severe Weather and Natural Disaster Guidelines	22
71111.04	Procedures	BOP AF-M2A	Aux. Feedwater System Train "A" Valve Lineup	7
		BOP DG-E2A	Diesel Generator Train "A" Electrical Lineup	3
		BOP DG-M2A	Train "A" Diesel Generator System Valve Lineup	10
		BOP DG-M2B	Train "B" Diesel Generator System Valve Lineup	9
		BOP SI-M1A	Train "A" Safety Injection Valve Lineup	2
71111.05	Corrective Action Documents	2392278	Battery in Use Light Did Not Illuminate	10/07/2014
		2392279	Battery in Use Light Did Not Illuminate	10/07/2014
		4102915	2PA39J Battery Trouble Light Lit	02/11/2018
	Corrective Action Documents Resulting from Inspection	4398693	NRC Identified, Non TRM Fire Door Not Latching	01/28/2021
		4406643	NRC ID- 0DSD606 (0B SX M/U PP DO Tank Room) Does Not Lock	03/04/2021
	Drawings	6E-2-4030FP43	Fire Detection Control Cabinets 2PA39J & 2PA49J	D
		6E-2-4171	Elevation Fire Detection Control Cabinet 2PA39J	P
		6E-2-4186	Elevation Fire Detection Control Cabinet 2PA49J	S
	Fire Plans	FZ 18.1-1	1B DG & Switchgear Room Air Shaft	2
		PFP #201	Fire Area/Zone: FZ 18.6-0, Service Bldg. 401'-0" ELEV. Ground Floor	3
		PFP #48	FZ 5.4-2, Aux. Bldg. 451' Div. 22 MEER	3
		PFP #50	FZ 5.5-2, Aux. Bldg. 451' U2 AEER	4
	Miscellaneous	21-04-MMD FLS Office	Fire Drill Scenario No. 21-04	12/30/2020
	Procedures	BAP 1100-10T	Fire Drill Planning Checklist	0
		OP-AA-201-003	Fire Drill Performance	18
	Self-Assessments	A-Shift-21-04	Fire Drill Record	02/01/2021
71111.07A	Engineering Evaluations	BYR97-467	Component Cooling Heat Exchanger Tube Plugging Evaluation	7

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.11Q	Miscellaneous		LORT Scenario	02/25/2021
71111.12	Corrective Action Documents	04396726	0VC Make Up Fan Trip	01/19/2021
		04396745	Unit 2 RX Power Oscillating Since Last Outage	01/19/2021
71111.13	Corrective Action Documents Resulting from Inspection	4403035	NRC Identified Item on PBI	02/17/2021
	Miscellaneous	UFSAR 9.4.5.1	Auxiliary Building HVAC	13
	Procedures	BAP 1100-3A3	Pre-Evaluated Plant Barrier Matrix	43
		CC-AA-201	Plant Barrier Control Program	13
71111.15	Corrective Action Documents	04397062	2B DG Tripped During Monthly Start	01/21/2021
		4399739	Fire Damper oVC187Y Electro-Thermal Links Blown, Damper Open	02/02/2021
		4403121	0B SX CT Fan Oil Pressure Alarm	02/19/2021
		4407267	U2 PDMS/PPC Problem Alarm	03/13/2021
	Operability Evaluations	441170	1FW009A, Main Feedwater Isolation Valve Hydraulic Pump Was Cycling	03/26/2021
	Procedures	OP-AA-108-115	Operability Determinations	24
71111.18	Engineering Changes	632575	FCN-CAEO-40544: Decrease of Full Load Tref from 587 deg F to 586.5 deg F	03/03/2021
	Work Orders	5093368	Revise Unit 1 RCS Program Reference Temperature in Ovation	03/03/2021
71111.19	Corrective Action Documents	4411158	0B Diesel Fire Pump Battery #2, Cell#1 Low Specific Gravity	03/24/2021
	Corrective Action Documents Resulting from Inspection	4406587	NRC ID: Boric Acid Build up on 0PI-FC006	03/04/2021
	Procedures	2BOSR 5.5.8.CS.5-1c	Comprehensive Inservice Testing (IST) Requirements for Containment Spray Pump 2CS01PA	10
	Work Orders	4966365	1A CS PMT Following Maintenance	02/03/2021
		5109618	0BOSR 10.B.2-1, Diesel Fire Pump Battery Monthly Surveillance	03/26/2021
		5115336	(NEIL) - 2CS01PA Comprehensive IST RQMTS for	02/19/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Containment Spray	
		5126616	0BOSR 10.B.6-1, Diesel Fire Pump Monthly Surveillance	03/26/2021
		5136033	Unexpected Auto Start of 0B Fire Pump	03/25/2021
71111.22	Miscellaneous	STI BY-20-004	Revise Valve Alignment Verification Monthly Surveillance from Monthly to Quarterly	03/01/2021
	Procedures	1BOSR 7.5.4-2	Diesel Driven Auxiliary Feedwater Pump Monthly Surveillance	32
		2BOSR 5.5.8.RH.5-2a	Group A Inservice Testing (IST) Requirements for Residual Heat Removal Pump 2RH01PB	12
	Work Orders	5098934	(NEIL) - 2RH01PB Group A IST Requirements for RH Pump	01/22/2021
		5115341	LR-2BOSR 8.1.2-1, 2A D/G Monthly Surveillance	02/03/2021
		5118865	1BOSR 7.5.4-2, 1B AF PP Run	02/18/2021
71151	Miscellaneous		Unplanned Power Changes Data from Logs (01/01/2020 - 12/31/2020)	
71152	Corrective Action Documents	4234300	Specific Gravity is Low on the 0D Dsl Drv FP Batt #2	03/29/2019
		4399590	New PBI Required for 1A CS Pump Work Window	02/02/2021
		4407661	Incorrect PBI Permit Generated for 2A RH PP Work Window	03/09/2021
	Miscellaneous	0BOL 10.g	LCOAR Fire Assemblies TRM LCO # 3.10.g for PBI 20-295 and 296	02/11/2021
		OP-AA-201-007, Attachment 2	"Sample" Fire Watch Inspection Log for 0DSD245/0DSD847	02/11/2021
		PBI 20-295	CC-AA-201-F-01, Plant Barrier Impairment Permit for 0DSD245	02/11/2021